DOCUMENT RESUME

ED 470 955 RC 023 829

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TITLE	School Attendance and Child Labor in Ecuador. Policy Research Working Paper Series.
INSTITUTION	World Bank, Washington, DC.
REPORT NO	WPS-2939
PUB DATE	2002-12-00
NOTE	29p.
AVAILABLE FROM	For full text: http://econ.worldbank.org/view.php?type=5&id=22733.
PUB TYPE	Numerical/Quantitative Data (110) -- Reports - Research (143)
EDRS PRICE	EDRS Price MF01 Plus Postage. PC Not Available from EDRS
DESCRIPTORS	Age Groups; *Attendance; *Child Labor; Dropouts; *Family Characteristics; Family Income; Females; Foreign Countries; Males; Poverty; *Rural Youth; Tables (Data); *Urban Youth; *Wages
IDENTIFIERS	*Ecuador

ABSTRACT

Data from Ecuador's Living Standard and Measurement Surveys were used to analyze the characteristics and determinants of child labor and schooling. Of particular interest was the influence of adult wages on child labor. Survey data on children aged 10-17 included sex, age, rural or urban residence, monthly wages, whether or not attending school, and whether or not working. Family characteristics included educational level and occupational sector of household head and spouse, region of residence, presence of babies or other older children in household, and age and wages of the head of household. Household demographic variables had an impact on the probabilities of children working and of children attending school and had a stronger impact in urban than rural areas. However, in rural areas boys were more likely to work and less likely to attend school than were girls. Parental education had direct and indirect effects on the work and schooling of children. Household head's occupational sector had an impact on both schooling and work. Rural children of household heads working in agriculture were more likely to work than other children. Increasing wages of the household head had a small positive impact on child schooling in rural areas. Implications for public policy are discussed. (Contains 14 statistical tables.) (SV)

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School Attendance and Child Labor in Ecuador

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ED 470 955

Abstract

This paper uses the Ecuador Living Standard and Measurement Surveys (LSMS 1998, 1999) to analyze the characteristics as well as the determinants of child labor and schooling. It is shown how interventions at the level of adults affect child labor and school enrollment. For example, an employment policy encouraging employment in the formal modern sector reduces child labor and increases schooling. In rural areas, a wage policy (increase in the wage of the household head) has positive implications for the children, while it is less effective in urban areas.

Este trabajo utiliza las Encuestas de Ingreso y Gasto de los Hogares en Ecuador (1998 y 1999) para analizar las características y determinantes del trabajo infantil y la asistencia escolar. Se muestra como las políticas gubernamentales dirigidas a los adultos afectan tanto al trabajo infantil como a la asistencia escolar. Por ejemplo, una política dirigida a la creación de empleos en el sector moderno formal reduce la probabilidad del trabajo infantil e incrementa la asistencia escolar. En zonas rurales, una política dirigida a incrementar el ingreso del jefe del hogar tiene resultados positivos en la asistencia escolar y reduce el trabajo infantil, mientras que ésta es menos efectiva en zonas urbanas.

World Bank Policy Research Working Paper 2939, December 2002

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School Attendance and Child Labor in Ecuador

Gladys López-Acevedo

1. Introduction

Child labor is a topic of concern in Ecuador, particularly because it is expected that the current economic crisis might have long lasting effects on school drop out and repetition. The debate on child labor is not only due to its potential impact on the present and future welfare of children but it is also related to international pressures for the alleviation of child labor. Child labor is an important problem in Ecuador. Yet, there are no official statistics on the magnitude of this problem. [1]

A number of government programs have been designed in Ecuador at least in part to prevent child labor. This includes among others *La Beca Escolar del Programa Todos los Niños y Niñas en la Escuela*, and School Breakfast which reduce the price of schooling and thereby may reduce child labor. While such programs tend to have positive impacts for child labor and schooling, these impacts remain limited. School feeding programs are especially popular in Latin America (see e.g. Phillips et al., 1995 on Honduras, Dall'Acqua, 1991, on Brazil, and Jacoby, Cueto and Politt, 1996, on Peru).

Unfortunately, these programs are seldom evaluated. Subbarao et al. (1997) report that out of 97 social programs surveyed in Latin America, including many school feeding programs, only ten had been evaluated. When evaluations are conducted, they tend to focus on participation, coverage, and targeting without going into the more difficult task of assessing program impacts (Grosh, 1994). And when attempts are made to assess program impacts, this is often done without due consideration of bias which may result from the endogeneity of program placement. The lack of good evaluation is all the more damaging as the funds invested are typically large. In light of the above, it is important to assess empirically the impact of policy interventions at the level of parents or government who could help prevent child labor.

The impact of adult wages on child labor has been discussed among others by Basu and Van (1998) who note that if wages are low, parents may have to send their children to work in order to survive, and this often happens to the detriment of schooling. If wages are high, then

[1] The monthly statistical survey from the Central Bank of Ecuador and P.U.C.E captures detailed labor information for children 6 years old and above in Quito, Guayaquil and Cuenca. However, a preliminary analysis shows that on average 94% of the children captured by the survey are enrolled at school and not working.

parents may not send their children to work anymore. According to Basu and Van's Substitution Axiom, adult and child labor are substitutes. Moreover, according to their Luxury Axiom, children will be sent by their parents to work only if the household income from non-child labor is very low. Basu and Van then explain that there may be multiple equilibria in the labor market, and that in some cases, international policies to abolish child labor might have some unexpected and even undesirable effects.

This paper tests empirically whether an increase in adult wage indeed reduces child labor. Because of potential substitution effects, the theoretical impact of an increase in the wage of adults on the schooling and work decisions of children remains uncertain, and this is reflected in the empirical literature. Ray (1998) finds that higher wages for adults reduces the probability that children will be working in Peru, but not in Pakistan. Psacharopoulos (1997) finds that the impact of household income on schooling and child labor is significant on Venezuela, but less so in Bolivia. In Peru, Patrinos and Psacharopoulus (1997) find a significant impact of family income on a measure of age-grade distortion for children, but the impact on child labor is not significant.

This paper is structured in the following way. Section 2 discusses the characteristics of child labor in Ecuador.[2] Section 3 analyzes the determinants of school enrollment and of child labor for boys and girls, distinguishing rural from urban areas. Section 4 discusses the percentage change in the probabilities of working or of going to school for children as a result of changes in relevant variables. Section 5 has the concluding remarks.

2. Characteristics of Child Labor in Ecuador

The Living Standard and Measurement Survey (LSMS) 98 and 99 were used to analyze the characteristics and determinants of child labor and schooling in Ecuador. It is not possible to integrate a panel with the LSMS surveys. The LSMS surveys from INEC are nationally representative. In 1999, the sample consisted of 1851 children aged 10 through 15. In 1998, the sample consisted of 3742 children aged 10 through 15; 3146 children aged 10-14 and 1810 teenagers aged 15-17. No information is available on the survey of the work patterns of younger children. This represents a study limitation, but at the same time the data remains interesting because adolescent children are precisely those who are more likely to work and to drop out of school.

Table 1 provides summary statistics regarding the extent of schooling and work in the 1998.[3] It shows that 29 percent of all children (10 through 14) go to work and attend school while 11 percent are at work and do not attend school. According to the 98 sample, 27 percent of all children aged between 10-15 work and attend school while 12 percent are at work and do not attend school. Those who are at work and do not attend school is much higher for teenagers (15-17). Although the available statistics in various Latin-American countries are not perfectly comparable, child and youth labor seems to be frequent in South America compared to Central American countries. In Ecuador, the participation of children and teenagers in the labor force is higher for boys than for girls, particularly in rural areas. Tables A1.3 and A1.4 in the annex indicate that in 1999, the categories work -school and work and no school slightly increased for rural boys and girls.

Table 1 CHILD LABOR AND SCHOOLING BY AREA AND BY SEX

	Children 10-14 years old					Children 15-17 years old				
	Urban boy	Rural boy	Urban girl	Rural girl	Total	Urban boy	Rural boy	Urban girl	Rural girl	Total
Work and school	22.3	44.7	17.7	33.5	29.2	30.8	32.5	24.0	19.2	27.0
Work and not school	3.3	18.2	4.8	18.0	10.7	19.0	52.2	17.4	48.7	32.5
Not work and school	72.0	34.8	76.4	45.8	58.0	43.2	10.7	52.9	23.6	34.1
Not work and not school	2.5	2.3	1.1	2.7	2.1	7.0	4.6	5.6	8.5	6.4
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: LSMS,1998

The LSMS surveys shed light into the characteristics of child labor in urban and rural areas.[4] Of the 10-14 year old children working and attending school 57 percent were boys in 1998, and for the 15-17 age group it was 62 percent. From the total of children working and attending school in the 10-14 age group, 71 percent were in primary school, 81 percent had no access to social security and close to 48 percent lived in La Costa. Table A2.1 indicates that the percentage of working population is higher for the 15-17 years old group compared to the 10-14 group. It is sometimes argued that working children are migrants from less developed areas. Here the findings contradict the conventional wisdom since most of the children and youngsters (around 87 percent) work in their city of origin. In contrast with the working and

[2] This paper uses two definitions of child labor: i) non-domestic work and ii) non-domestic plus domestic work. This is done because most surveys in Latin America only have information on non-domestic work. However, this paper also takes into account domestic work since it is likely that girls' work is underestimated.

[3] The Annex 1 presents other tables with more information.

attending school children, those working and not attending school are older. School attendance is higher in La Costa than in La Sierra or Amazonia.

Table A2.2 shows that of the 52 percent urban children from the 10-14 age group only 20 percent work and attend school while from the remaining 48 percent rural children, 39 percent work and attend school. In the teenage group, the percentage is similar for those who work and attend school.

Average total monthly labor earnings (wages) from the primary and secondary jobs are shown on Table 2. For all working children 10-11 years old, regardless school status, average monthly wages are higher in urban than in rural areas. Average monthly wages increase with the age group and generally as we moved from the bottom to the top per capita consumption quintile particularly for the first age group.

Table 2 AVERAGE MONTHLY (USD)WAGES* BY AGE, AREA AND QUINTILE**

Average monthly Wages in dollars (LSMS,98), Working Children							
Children	**urban**	**rural**	**1st. Quintile**	**2nd. Quintile**	**3rd. Quintile**	**4th. Quintile**	**5th. Quintile**
10-11 years old	$6.26	$4.81	$1.22	$4.35	$2.88	$8.29	$6.99
Std. Deviation	*$12.25*	*$6.03*	-	*$13.18*	*$3.06*	*$14.11*	*$8.22*
12-14 years old	$7.04	$16.15	$4.49	$6.34	$10.20	$14.85	$12.96
Std. Deviation	*$14.73*	*$23.85*	*$14.52*	*$9.29*	*$22.80*	*$24.45*	*$16.80*
15-17 years old	$11.85	$24.68	$11.35	$17.71	$16.09	$17.02	$23.06
Std. Deviation	*$28.48*	*$27.76*	*$21.54*	*$34.56*	*$27.14*	*$24.47*	*$33.09*
Average and Std. monthly Wages in dollars (LSMS,98), Working and Attending School Children							
Children	**urban**	**rural**	**1st. Quintile**	**2nd. Quintile**	**3rd. Quintile**	**4th. Quintile**	**5th. Quintile**
10-11 years old	$6.31	$3.40	$1.22	$4.35	$2.79	$8.29	$5.84
Std. Deviation	*$12.39*	*$3.87*	-	*$13.18*	*$3.14*	*$14.11*	*$7.64*
12-14 years old	$6.66	$14.10	$4.28	$6.03	$13.50	$8.72	$13.52
Std. Deviation	*$14.22*	*$25.15*	*$16.73*	*$7.82*	*$29.67*	*$14.51*	*$21.18*
15-17 years old	$10.46	$20.61	$14.01	$16.44	$11.35	$9.34	$19.52
Std. Deviation	*$28.80*	*$29.06*	*$28.77*	*$33.51*	*$20.70*	*$11.95*	*$45.60*
Average monthly Wages in dollars (LSMS,98), Working and Not Attending School Children							
Children	**urban**	**rural**	**1st. Quintile**	**2nd. Quintile**	**3rd. Quintile**	**4th. Quintile**	**5th. Quintile**
10-11 years old	$4.13	$9.68	-	-	$4.13	-	$9.68
Std. Deviation	-	*$8.90*	-	-	-	-	*$8.90*
12-14 years old	$7.87	$17.83	$5.08	$9.43	$5.98	$23.38	$12.61
Std. Deviation	*$15.75*	*$22.60*	*$4.17*	*$18.09*	*$5.28*	*$31.81*	*$13.42*
15-17 years old	$13.34	$26.43	$8.96	$19.56	$20.24	$21.27	$24.61
Std. Deviation	*$28.06*	*$27.00*	*$11.18*	*$35.96*	*$31.13*	*$28.28*	*$25.65*

***Wages are adjusted by the period of work frequency; **Per capita consumption Quintile*

[4] Annex 2 presents tables of the characteristics of child labor and schooling by different classifications.

Young children (10-11 years old) that work and receive pay (regardless of school status) are occupied in their primary job 40 and 29 hours on average per week in urban and rural areas respectively. Children (12-14 years old) work 42 and 37 hours on average in urban and rural areas respectively, while teenagers (15-17 years old) work 48 and 44 hours on average a week. There is not a clear pattern in the number of hours worked across age groups and per capita consumption quintile although, it seems young children work less hours as the per capita consumption quintile increases. Table A2.3 shows some interesting characteristics. The majority of children are working at home with no pay or in the family agricultural activities. Moreover, it seems that teenagers in urban areas work as regular workers while in rural areas they help at home or with family seasonal agricultural activities.

The majority of working children live with their family. For these children, the main reason for working is to help at home particularly in the rural areas. The survey confirms that working children come from the poorest social classes with the head of the household earning less than 600,000 sucres (110.13 USD) on average a month.[5] A high proportion of the urban working children are in the informal sector probably immersed in a range of activities such as selling newspapers, washing cars, polishing shoes, entertaining drivers through small shows at crossroads, and to a lesser extent begging. While one might infer that some parents use their young children for begging it is not possible to verify this. Even if this occurs, the parent rationale may have as much to do with the lack of child care alternatives among other things. In rural areas, 67 percent of the children are at work.

The head of the household with working children are generally men in their mid-forties with primary education, working in the primary industry as an employee or working in the informal sector. This can be seen clearly on tables A2.4 and A2.5. The head of the household monthly wages range between 500,000 and 1,600,000 sucres on average (92 through 294 USD).

3. Determinants of child labor and schooling in Ecuador

The analysis of the determinants of child labor and schooling were first conducted separately by urban and rural areas, as well as for males and females in each of these two locations since there was an a priori assumption that there were differences in behaviors regarding both location and gender. A bivariate probit model of child labor and school attendance was estimated. The first reason was to test if the two outcomes are jointly determined (from the

[5] It is worth pointing out that close to 70% of the labor force work all year.

correlation in the two equations), and secondly it was to ascertain whether one outcome is more or less likely without the other. With this method we can establish, for example, what is the likelihood for a child to work if he or she attends school or, conversely, if school attendance is more likely without child work. The advantage of using bivariate probits rather than simple probits is that the correlation between the error terms of the work and no schooling equations in the analysis is taken into account, thereby gaining in efficiency.

The schooling variable takes a value of one if the child does not attend school, and a zero otherwise. The work variable takes a value of one in case of employment (whether with or without pay), and zero otherwise. Thus, the impact of the independent variables such as the parents' schooling and occupation on the two outcomes (work and no schooling) can be compared directly without having to change the signs of the coefficients.

Denoting y^*_1 and y^*_2 the latent and unobserved continuous no schooling and work variables, by y_1 and y_2 their categorical observed counterparts, and by X the vector of independent exogenous variables, the model can be expressed as:

$$y^*_1 = \beta_1 \cdot X + \varepsilon_1$$
$$y^*_2 = \beta_2 \cdot X + \varepsilon_2$$

and

$$y_i = 1 \quad if \quad y^*_i > 0; \quad y_i = 0 \quad otherwise$$

and

$$E[\varepsilon_1] = E[\varepsilon_2] = 0$$
$$Var[\varepsilon_1] = Var[\varepsilon_2] = 1$$
$$Cov[\varepsilon_1, \varepsilon_2] = \rho$$

where the error terms have a bivariate normal distribution.

Using this framework, two separate models were estimated for the 10-14 age group and for the 15-17 age group.[6] The model has as independent regressors the gender, the geographic location of the household, the information on household demographics, educational level of the head of the household and the spouse, sector and occupation of the head, and whether the head has a formal or informal job. Wages of the head was also included as regressor to assess the impact of a change in earnings on work and schooling for the children. Wages of the head was included rather than total income because the latter is endogenous since it depends on the work of

[6] The results of this model are presented in the Annex, on Tables A3.1 and A3.2.

children. Similarly, the wages of the spouse were not used because they were likely to have a substitution effect between the work of children and the work of the spouse. The model can then be used to assess, for example, the impact on work and schooling of a change in occupation for the head from the farm to the non-farm sector. Other models were estimated.[7]

Results

Demographic variables have an impact on the probability of working and/or attending school particularly for teenagers. In urban areas, in households with many babies, the teenagers are more likely to work and not go to school. The effect of having older children in the household is associated with a higher probability of going to school and a lower probability of going to work. Both effects can be interpreted as being due to the fact that older children or teenagers have to stay at home to care for the younger children. The more babies, the more work to be done at home. On the other hand, the more older children and adults that are at home, the more some of them can go to school while the others stay at home. A large number of adults increases the probability of not going to school for those 15-17 years old in urban areas, but it decreases the probability of 10-14 years old children to have to work. Households with female heads in urban areas send the teenagers to work more often, but this does not seem to take place to the detriment of schooling. The older the head of the household is decreases the probability of work and increases that of schooling for teenagers The demographic effects tend to be stronger in urban than in rural areas. Gender has a large impact on the probability of working in rural areas for both children and teenagers, since boys work more and attend less to school.

After controlling for household characteristics, there are some statistically significant differences between areas as to the percentage of children not attending school, and/or working. By controlling for household characteristics, we net out most of the impact of lower endowments at the household level when we look at the impact of location on work and schooling. For most of the samples selected it is observed that pure geographical effects on work and schooling are not limited at the regional or income level.

The education of the parents can affect the work and schooling of children directly and indirectly. The direct effect stems from the fact that better educated parents may value the education of their children more than less educated parents. Or even if they do not, better educated parents can easily help their children succeed and remain in school much easier. The

[7] Results by gender and quintile are available upon request.

indirect effect comes from the positive correlation between education and income as better educated parents earn higher salaries and do not necessarily need to send their children to work.[8] In general, the impact of the parents' education is greater on the probability of going to school than on the probability of working. This suggest that the direct effect may be larger than the indirect effects (since the first ones are directly related to the benefit perceived by better education while the latter is more need-based through work).

The sector of occupation of the household's head has an impact on both work and schooling. The children of heads working in the agriculture sector work more than those working in other industries. It is also important the effect of not being employed or belonging to the informal sector. When household heads are in the informal sector, they tend to send their children to work, perhaps because the instability provided by informal employment or to complement family's income. This phenomenon is observed predominantly in urban areas for children and teenagers. In rural areas, being in the agricultural sector has a negative impact on school attendance for children and teenagers possibly because of their seasonal work. It also increases the probability of working for all children. Thus, a policy encouraging jobs in non agricultural sectors would help the parents and the children indirectly. The variables such as education of spouse and head of the households as well as government education expenditures per student[9] turn out to be significant in reducing the probability of working and increasing the probability of school attendance.

4. Percentage Impact for the children of private and government policies

The results obtained so far are related to the impact of working and schooling in changes of the relevant variables (i.e., occupation, sex, gender, wages and geographic area). This section computes the percentage changes in the probabilities of working or attending school of children and teenagers conditioned on these relevant variables' changes provided that the rest of the variables remain at their mean levels. These values are reported in table 6 below. Notice that, in urban areas, an increase in the household schooling level decreases significantly the probability of working and not attending school. A change from the modern to the informal sector increases the probability of working by 5 percent for the 10-14 years old children. A change from modern to

[8] The results from the different models might imply that in Ecuador the indirect effect is rather small since the coefficient of the education of the parents does not change significantly in the model without the wages of the head as an independent variable. Results of this model are available upon request.

[9] Results including government education expenditure per student are available upon request.

agricultural sector increases the probability of not attending school by 10-14 year olds by almost 9 percent in the rural localities. Moving from la Costa to La Sierra has an increasing effect both in the probability of working and not attending school in the rural communities. In

addition, gender affects negatively the probability of working, indicating that boys work more often. In urban areas, an occupational shift for the head of household from a modern sector to an agricultural one increases the probability of working for teenagers.

Table 3

PROBABILITY CHANGE

Urban area (Children 10-14 years)

Prob (work | nivel i, x mean)		*Prob (work | nivel j, x mean)*		*Probability change*
Coast Region	23.86	Sierra Region	19.60	-4.26
None education head	47.49	Primary education head	28.42	-19.07
None education head	47.49	Secondary education head	17.62	-29.87
None education head	47.49	Higher education level head	13.95	-33.54
Modern sector head	22.44	Informal sector head	27.66	5.23
Modern sector head	22.44	Unemployed	7.65	-14.79

Rural area (Children 10-14 years)

Prob (work | nivel i, x mean)		*Prob (work | nivel j, x mean)*		*Probability change*
Male children	63.60	Female children	52.64	-10.96
Coast Region	50.95	Sierra Region	62.82	11.87
Coast Region	50.95	Amazonia Region	64.98	14.03
Adults mean	58.15	Adults mean + 1	52.18	-5.97
None education head	66.01	Primary education head	57.14	-8.87
None education head	66.01	Secondary education head	46.97	-19.04
Modern sector head	44.25	Informal sector head	56.43	12.19
Modern sector head	44.25	Agriculture sector head	64.19	19.94
None education spouse	71.95	Primary education spouse	54.37	-17.58
None education spouse	71.95	Secondary education spouse	49.48	-22.47
None education spouse	72.95	Higher level education spouse	35.30	-37.65

PROBABILITY CHANGE

Urban area (Children 10-14 years)

Prob (no school | nivel i, x mean)		*Prob (no school | nivel j, x mean)*		*Probability change*
Children mean	3.87	Children mean + 1	1.30	-2.57
Adults mean	3.87	Adults mean+1	6.77	2.91
None education head	25.18	Primary education head	7.02	-18.15
None education head	25.18	Secondary education head	1.74	-23.43
None education head	25.18	Higher education level head	1.78	-23.40
None education spouse	3.98	Adults education spouse	0.00	-3.98

Rural area (Children 10-14 years)

Prob (no school | nivel i, x mean)		*Prob (no school | nivel j, x mean)*		*Probability change*
Coast Region	14.66	Sierra Region	20.54	5.89
Babies mean	17.52	Babies mean + 1	22.34	4.82
None education head	20.51	Secondary education head	9.34	-11.18
None education head	20.51	Higher education level head	5.11	-15.41
Modern sector head	10.91	Agriculture sector head	19.83	8.92
Wages head	17.52	Wages head + 10000	17.48	-0.04
None education spouse	20.13	Adults education spouse	35.61	15.48
None education spouse	20.13	Secondary education spouse	5.81	-14.32
None education spouse	20.13	Higher level education spouse	1.40	-18.73
	20.13	Not spouse	32.81	12.68

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Table 3 CONTINUED

PROBABILITY CHANGE

Urban area (Children 15-17 years)

Prob (work | nivel i, x mean)		*Prob (work | nivel j, x mean)*		*Probability change*
Male Children	48.55	Female Children	40.81	-7.74
Coast Region	48.54	Sierra Region	39.13	-9.41
Babies mean	44.97	Babies mean + 1	56.62	11.66
Male head	40.91	Female head	59.88	18.96
Age mean head	44.97	Age mean head + 1	40.73	-4.24
None education head	68.06	Secondary education head	39.02	-29.04
None education head	68.06	Higher education level head	29.44	-38.61
Modern sector head	39.91	Informal sector head	51.84	11.93
Modern sector head	39.91	Agriculture sector head	59.56	19.65
None education spouse	72.05	Primary education spouse	48.55	-23.50
None education spouse	72.05	Secondary education spouse	40.65	-31.39
None education spouse	72.05	Not spouse	38.70	-33.35

Rural area (Children 15-17 years)

Prob (work | nivel i, x mean)		*Prob (work | nivel j, x mean)*		*Probability change*
Male children	88.54	Female children	73.79	-14.75
Age mean head	82.37	Age mean head + 1	80.66	-1.70
None education head	87.02	Secondary education head	66.93	-20.09
None education head	87.02	Higher education head	69.84	-17.18
Modern sector head	73.45	Agriculture sector head	88.30	14.85

PROBABILITY CHANGE

Urban area (Children 15-17 years)

Prob (no school | nivel i, x mean)		*Prob (no school | nivel j, x mean)*		*Probability change*
Coast Region	23.32	Amazonia Region	13.59	-9.74
Babies mean	21.23	Babies mean + 1	39.62	18.38
Children mean	21.23	Children mean + 1	14.91	-6.32
Adults mean	21.23	Adults mean+1	32.39	11.15
Age mean head	21.23	Age mean head + 1	19.01	-2.23
None education head	35.17	Secondary education head	17.38	-17.79
None education spouse	30.64	Secondary education spouse	12.33	-18.30
None education spouse	30.64	Higher education spouse	11.94	-18.70

Rural area (Children 15-17 years)

Prob (no school | nivel i, x mean)		*Prob (no school | nivel j, x mean)*		*Probability change*
Babies mean	57.12	Babies mean + 1	68.73	11.61
Age mean head	57.12	Age mean head + 1	54.49	-2.62
None education head	64.21	Secondary education head	31.45	-32.76
None education head	64.21	Higher education level head	18.36	-45.85
Modern sector head	46.26	Agriculture sector head	64.03	17.77

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Modern sector head	73.45	Not employee head	55.84	-17.61	Wages head	57.12	Wages head + 10000	57.05	-0.07
None education spouse	86.18	Adults education spouse	100.00	13.82	None education spouse	74.93	Adults education spouse	32.32	-42.60
None education spouse	86.18	Primary education spouse	75.46	-10.72	None education spouse	74.93	Primary education spouse	54.60	-20.33
					None education spouse	74.93	Secondary education spouse	52.90	-22.03
					None education spouse	74.93	Higher level education spouse	27.46	-47.46
					None education spouse	74.93	Not spouse	54.53	-20.39

5. Conclusions

To what extent do public policy interventions (or exogenous shocks) at the head of the household level contribute to the well-being of children, in particular to child labor and school attendance? This paper examined the determinants of child labor and school attendance among teenagers and children in both rural and urban areas. Among some of the main interesting results are that higher education for household heads and spouses increases the probability of school attendance and reduces the probability of child labor. When a household head works in agriculture or in the informal sector it increases the children that work. A wage increase of the household head has a small, yet positive impact on child schooling in rural areas.

This paper pretends to be a more detailed work on the determinants of child labor and schooling in order to understand why, controlling for other variables, an occupational shift by household heads from the modern to the agricultural sector has a large impact on the probability to work and to go to school. However, the contribution of this paper is to point towards the possibility of additional gains in terms of children well being policies aimed at promoting productive farm and non-farm rural policies.

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ANNEX 1

Table A1.1 CHILD LABOR AND SCHOOLING BY AREA AND SEX, 1998

10 - 15 years old	Urban boy	Rural boy	Urban girl	Rural girl	Total
Work and school	214	420	133	244	1011
Work and not school	43	205	40	147	435
Not work and school	634	315	679	469	2097
Not work and not school	31	35	28	105	199
Total	922	975	880	965	3742

Source: LSMS,1998

Table A1.2 CHILD LABOR AND SCHOOLING BY AREA AND SEX (1), 1998

10-15 years old	Urban boy	Rural boy	Urban girl	Rural girl	Total
Work and school	23.5	44.2	17.9	31.6	29.0
Work and not school	4.9	21.5	6.0	23.0	13.5
Not work and school	68.2	31.8	74.5	41.9	54.8
Not work and not school	3.4	2.5	1.5	3.5	2.7
	100.0	100.0	100.0	100.0	100.0

Source: LSMS,1998
(1) Domestic work is included as part of labor.

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Table A1.3 CHILD LABOR AND SCHOOLING BY AREA AND SEX, 1999

10 - 15 years old	1999				
	Urban boy	Rural boy	Urban girl	Rural girl	Total
Work and school	113	218	61	128	520
Work and not school	22	112	12	93	239
Not work and school	331	131	338	197	997
Not work and not school	15	18	18	44	95
Total	481	479	429	462	1851

Source: LSMS,1999

Table A1.4 CHILD LABOR AND SCHOOLING BY AREA AND SEX, 1999

10-15 years old	1999				
	Urban boy	Rural boy	Urban girl	Rural girl	Total
Work and school	23.0	44.9	14.9	35.4	28.4
Work and not school	5.4	23.3	4.6	22.5	12.9
Not work and school	69.0	27.8	77.9	39.1	55.6
Not work and not school	2.6	4.0	2.6	3.0	3.0
	100.0	100.0	100.0	100.0	100.0

Source: LSMS,1999
(1) Domestic work is included as part of labor.

ANNEX 2

Table A2.1 CHARACTERISTICS OF CHILD LABOR AND SCHOOLING

	10-14 years old					15-17 years old				
Variable	**Work and School 29%**	**Work and Not school 11%**	**Not work and school 58%**	**Not work and Not school 2%**	**Total**	**Work and school 27%**	**Work and Not school 33%**	**Not work and school 34%**	**Not work and not school 6%**	**Total**
Age										
10	16.1	3.5	23.7	10.2	19.0					
11	19.6	4.9	22.8	8.7	19.6					
12	24.7	14.2	21.9	19.1	21.8					
13	21.9	34.9	16.0	21.8	19.9					
14	17.8	42.5	15.7	40.2	19.7					
15						34.1	28.1	37.1	29.9	32.9
16						34.0	31.6	32.0	29.0	32.2
17						31.9	40.2	30.9	41.1	34.9
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Sex										
Male	56.7	48.2	47.2	56.3	50.3	61.9	54.3	45.3	49.2	53.0
Female	43.3	51.8	52.8	43.7	49.7	38.1	45.7	54.7	50.8	47.0
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Schooling										
None-Preschool	0.8	2.0	0.5	18.5	1.1	0.8	1.6		10.7	1.4
Primary	70.6	92.8	65.7	70.7	70.2	10.0	79.4	4.2	54.5	33.5
Secondary	28.5	5.2	33.8	10.8	28.7	89.2	19.0	95.8	34.8	65.1
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Migration										
No migration	85.6	85.3	87.8	81.5	86.8	87.5	84.1	90.8	89.3	87.6
From Urban	5.4	7.5	6.1	7.0	6.1	5.5	6.3	4.4	4.2	5.3
From Rural	9.0	7.2	5.4	10.1	6.7	6.9	9.6	4.2	6.4	6.8
Other country	0.1		0.7	1.4	0.5	0.2		0.5		0.2
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Social Security.										
Private	0.8		4.4	1.4	2.8	1.9		8.2		3.3
No private	18.0	20.0	7.9	15.4	12.3	14.5	16.1	6.2	10.7	12.0
None	81.3	80.0	87.6	83.2	84.9	83.6	83.9	85.6	89.3	84.7
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Region										
Costa	48.4	34.9	55.2	59.5	51.1	59.6	48.8	51.9	71.2	54.2
Sierra	45.5	60.3	41.7	38.9	44.7	37.3	46.9	45.5	26.2	42.5
Amazonia	6.1	4.8	3.1	1.6	4.2	3.2	4.2	2.6	2.6	3.3
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: LSMS 98

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Table A2.2 CHARACTERISTICS OF CHILD LABOR AND SCHOOLING BY AREA

All children	10 - 14 YEARS OLD			15 - 17 YEARS OLD		
Variable	Urban	Rural	Total	Urban	Rural	Total
	52%	48%		56%	44%	
Age						
10	19.1	19.0	19.0			
11	20.8	18.4	19.6			
12	20.8	22.8	21.8			
13	19.5	20.3	19.9			
14	19.8	19.5	19.7			
15				30.1	36.4	32.9
16				32.8	31.4	32.2
17				37.1	32.2	34.9
	100	100	100	100	100	100
Sex						
Male	50.9	49.5	50.2	54.0	51.7	53.0
Female	49.1	50.5	49.8	46.0	48.3	47.0
	100	100	100	100	100	100
Schooling						
None-Preschool	0.9	1.4	1.1	1.0	2.1	1.4
Primary	60.8	80.3	70.2	17.9	53.1	33.5
Secondary	38.3	18.3	28.7	81.1	44.9	65.1
	100	100	100	100	100	100
Migration						
No migration	85.4	88.2	86.8	85.3	90.5	87.6
From Urban	7.3	4.7	6.1	6.9	3.3	5.3
From Rural	6.6	6.8	6.7	7.4	6.2	6.8
Other country	0.7	0.2	0.5	0.4	0.0	0.2
	100	100	100	100	100	100
Social Security.						
Private	5.2	0.2	2.8	5.9	0.0	3.3
No private	2.3	23.3	12.4	2.6	24.0	12.0
None	92.5	76.5	84.8	91.5	75.9	84.6
	100	100	100	100	100	100
Region						
Costa	59.9	41.4	51.0	61.7	44.6	54.2
Sierra	38.7	51.5	44.8	37.1	49.5	42.6
Amazonia	1.4	7.1	4.2	1.2	5.9	3.3
	100	100	100	100	100	100
Work and school	20.1	39.1	29.2	27.7	26.1	27.0
Work and not school	4.0	18.1	10.7	18.3	50.5	32.5
Not work and school	74.1	40.3	58.0	47.7	16.9	34.1
Not work and not school	1.8	2.5	2.1	6.4	6.5	6.4

	100	100	100	100	100	100

Source: LSMS 98

Table A2.3 CHARACTERISTICS OF WORKING CHILDREN (PAID AND UNPAID WORK) BY ECONOMIC ACTIVITY

	10 - 14 YEARS OLD			15 - 17 YEARS OLD		
	Area, 1998			Area, 1998		
Variable	**Urban**	**Rural**	**Total**	**Urban**	**Rural**	**Total**
	31%	**67%**		**43%**	**57%**	
Principal Occupation						
Worker (Empleado/obrero/ jornalero)	24.3	5.4	11.4	42.9	15.1	27.1
Self-employed	8.4	2.6	4.4	6.4	4.6	5.4
Working at home without pay	37.5	15.2	22.2	23.4	10.9	16.3
Not working at home and without pay	1.8	0.7	1.0	4.5	0.5	2.2
Rural worker	1.8	5.7	4.5	2.1	15.1	9.5
Agriculture self-employed		0.4	0.3	0.5	0.7	0.6
Working at home without pay (agricultural activities)	3.4	54.0	38.1	1.0	37.6	21.8
Not working at home and without pay (agricultural activities)	0.3	1.5	1.1		1.3	0.8
Domestic worker	6.8	0.9	2.8	9.2	2.6	5.4
Working in domestic type of activities	15.7	13.5	14.2	10.0	11.6	10.9
	100.0	100.0	100.0	100.0	100.0	100.0
Sector of Activity						
Primary	8.5	63.8	46.4	5.3	57.7	35.1
Manufacturing	12.6	6.7	8.6	17.5	7.3	11.7
Non-manufacturing	3.3	2.2	2.5	7.0	3.7	5.1
Commerce	37.7	8.4	17.6	34.4	10.0	20.5
Transports and telecommunications	0.7	0.0	0.2	3.5	0.6	1.8
Financial Services	2.6	0.1	0.9	1.6		0.7
Social Services	6.1	2.0	3.3	7.8	3.4	5.3
Other	12.8	3.1	6.2	13.1	5.6	8.8
Domestic Work	15.7	13.5	14.2	10.0	11.6	10.9
	100.0	100.0	100.0	100.0	100.0	100.0
Sector						
Modern	13.4	4.1	7.0	26.1	7.1	15.3
Informal	81.1	34.3	49.0	70.3	38.1	52.0
Agriculture	5.6	61.6	44.0	3.6	54.7	32.7
	100.0	100.0	100.0	100.0	100.0	100.0

Source: LSMS 98

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Table A2.4 CHARACTERISTICS OF THE HEAD OF THE HOUSEHOLD

	Children 10-14 years old					Children 15-17 years old				
Variable	**Work and School**	**Work and not school**	**Not work and school**	**Not work and not school**	**Total**	**Work and school**	**Work and not school**	**Not work and school**	**Not work and not school**	**Total**
Average Age	45.6	46.9	44.5	44.9	45.1	47.1	47.3	46.9	48.3	47.2
Sex										
Male	87.1	84.9	82.6	80.4	84.1	81.5	84.7	82.7	83.9	83.1
Female	12.9	15.1	17.4	19.6	15.9	18.5	15.3	17.3	16.1	16.9
	100	100	100	100	100	100	100	100	100	100
Schooling										
None	11.4	17	5.0	10.3	8.2	6.9	15.2	3.7	7.4	8.6
Adult education	4.8	6.0	1.0	0.6	2.6	2.3	2.3	0.7		1.6
Primary	63.3	71.2	49.4	77.7	56.4	61.8	67.8	41.2	69.9	57.3
Secondary	14.4	3.9	25.9	7.9	19.8	22.5	11.1	30.9	19.4	21.5
Higher Education-University	5.0	1.8	16.6	3.2	11.3	6.2	2.8	22.0	2.2	10.2
Higher Education-No University	0.9	0.1	1.1	0.2	0.9	0.1		0.3	1.1	0.2
Graduate School	0.2		1.0		0.6	0.2	0.8	1.1		0.7
	100	100	100	100	100	100	100	100	100	100
Occupation										
Worker (government)	5.2	1.4	13.1	6.2	9.4	7.0	2.1	18.3	6.9	9.2
Worker (non-government)	16.9	10.9	24.9	23.0	21.0	19.4	20.9	28.9	29.9	23.8
Patron/socio activo	7.7	5.3	9.7	4.8	8.5	9.8	6.8	9.4	6.5	8.5
Cuenta propia	22.6	13.5	21.0	17.4	20.6	31.1	16.3	22.5	17.1	22.5
No agro sin pago	1.0	0.2	0.8	1.2	0.8	1.2	0.7	1.4	1.2	1.1
Trab agrope	9.3	21.0	7.4	16.1	9.6	6.0	10.8	2.8	10.1	6.7
Patron finca/cta propia	31.7	38.4	9.7	9.7	19.2	17.1	35.4	6.1	7.4	18.7
Agro sin pago	0.6	0.8	0.1		0.3	0.2	0.8			0.3
Does not work	5.1	8.5	13.2	21.7	10.5	8.2	6.3	10.6	21.0	9.2
	100	100	100	100	100	100	100	100	100	100
Industry										
Primary	45.8	65.1	21.0	32.1	33.2	26.5	52.5	11.5	26.4	29.9
Manufacturing	9.3	5.6	10.3	9.1	9.5	11.1	8.4	11.2	9.5	10.1
Non manufacturing	8.9	5.6	8.7	11.4	8.5	8.3	10.2	12.1	10.1	10.3
Commerce	14.2	7.4	15.2	6.8	13.9	20.5	12.2	15.6	13.3	15.7
Transport Services	4.4	2.0	7.5	4.2	5.9	6.4	3.6	7.5	3.4	5.7
Financial Services	1.4	1.1	4.0	1.5	2.9	1.0	1.5	6.4	1.4	3.0
Social Services	7.3	1.4	14.5	5.8	10.8	13.0	2.6	19.9	7.4	11.6
Other	3.6	3.3	5.7	7.3	4.9	5.0	2.6	5.2	7.5	4.5
Not working	5.1	8.5	13.2	21.7	10.5	8.2	6.3	10.6	21.0	9.2

Table A2.4 CONTINUED

Variable	Children 10-14 years old					Children 15-17 years old				
	Work and School	Work and not school	Not work and school	Not work and not school	Total	Work and school	Work and not school	Not work and school	Not work and not school	Total
Formal Sector										
Modern	19.5	8.9	35.6	23.8	27.8	24.4	16.7	48.7	20.7	29.9
Informal	33.9	22.3	34.0	28.7	32.6	44.1	30.1	31.7	40.9	35.1
Agriculture	41.6	60.3	17.3	25.8	29.2	23.4	47	9.0	17.5	25.8
Not working	5.1	8.5	13.2	21.7	10.5	8.2	6.3	10.6	21.0	9.2
	100	100	100	100	100	100	100	100	100	100
Spouse Schooling										
None	12.8	17.9	4.5	7.9	8.4	5.3	16.4	2.2	5.4	7.9
Adult education	1.6	4.4	0.8	0.6	1.4	2.4	1.0		1.1	1.0
Primary	52.8	52.7	39.8	56.5	45.4	48.6	54.6	36.0	57.4	46.8
Secondary	12.8	3.0	24.4	8.8	18.4	18.4	7.1	28.6	15.4	18.0
Higher Education-University	3.1	1.5	9.4	1.4	6.6	5.3	1.9	10.8	0.3	5.8
Higher Education-No University	0.4		0.7		0.5	0.5	0.3	1.1		0.6
Graduate School			0.3		0.2			0.3		0.1
No spouse	16.4	20.5	20.2	24.8	19.2	19.6	18.7	21.0	20.4	19.8
	100	100	100	100	100	100	100	100	100	100
Average Monthly Wages in Sucres	774,934	579,291	1,343,637	707,768	1,073,929	961,276	639,104	1,084,063	615,803	1,133,336

Source: LSMS 98

Table A2.5 CHARACTERISTICS OF THE HEAD OF THE HOUSEHOLD BY AREA

All Children	10 – 14 YEARS OLD			15 - 17 YEARS OLD		
	Area, 1998			Area, 1998		
Variable	**Urban**	**Rural**	**Total**	**Urban**	**Rural**	**Total**
Average age	44.0	46.3	45.1	45.2	49.7	47.1
Sex						
Male	81.0	87.6	84.2	78.5	89.0	83.1
Female	19.0	12.4	15.8	21.5	11.0	16.9
	100	100	100	100	100	100
Schooling						
None	3.8	13.0	8.2	3.6	14.9	8.6
Adult education	0.9	4.5	2.6	0.8	2.6	1.6
Primary	43.2	70.8	56.4	45.0	72.7	57.2
Secondary	29.4	9.4	19.8	32.0	8.0	21.4
Higher Education – University	20.2	1.7	11.3	17.2	1.5	10.3
Higher Education-No University	1.3	0.5	0.9	0.3	0.2	0.2
Graduate School	1.1	0.1	0.6	1.2	0.1	0.7
	100	100	100	100	100	100
Occupation						
Worker (government)	13.8	4.5	9.4	13.2	4.4	9.3
Worker (non-government	29.8	11.5	21.0	32.6	12.5	23.8
Patron/socio activo	12.5	4.2	8.6	11.2	5.0	8.5
Cuenta propia	25.7	15.1	20.6	27.4	16.1	22.4
No agro sin pago	1.0	0.6	0.8	1.6	0.5	1.1
Trab agrope	2.8	17.1	9.6	1.9	12.8	6.7
Patron finca/cta propia	1.3	38.7	19.2	1.4	40.6	18.7
Agro sin pago		0.6	0.3		0.8	0.3
No trabaja	13.0	7.7	10.5	10.7	7.2	9.2
	100	100	100	100	100	100
Industry						
Primary	7.4	61.3	33.2	7.0	58.8	29.8
Manufacturing	12.2	6.6	9.5	13.7	5.6	10.1
Non manufacturing	9.9	7.0	8.5	11.5	8.9	10.3
Commerce	21.0	6.1	13.8	21.8	7.8	15.7
Transport Services	9.3	2.2	5.9	7.8	2.9	5.7
Financial Services	5.0	0.6	2.9	5.3	0.2	3.0
Social Services	16.2	5.0	10.8	16.4	5.8	11.7
Other	6.0	3.6	4.9	5.7	2.8	4.4
Not working	13.0	7.7	10.5	10.7	7.2	9.2
	100	100	100	100	100	100

Table A2.5 CONTINUED

Variable	10 - 14 YEARS OLD Area, 1998 Urban	Rural	Total	15 - 17 YEARS OLD Area, 1998 Urban	Rural	Total
Formal Sector						
Modern	42.1	12.2	27.8	43.5	12.9	30.0
Informal	40.8	23.7	32.6	42.5	25.6	35.1
Agriculture	4.1	56.4	29.2	3.3	54.2	25.7
Not working	13.1	7.7	10.5	10.7	7.2	9.2
	100	100	100	100	100	100
Average Monthly Wages in Sucres	1,554,261	574,638	1,073,695	1,551,163	612,201	1,132,866
Spouse Schooling						
None	3.4	13.9	8.4	2.2	15.0	7.8
Adult education	0.4	2.5	1.4	0.5	1.6	1.0
Primary	32.6	59.3	45.4	35.4	61.2	46.8
Secondary	28.5	7.3	18.4	26.5	7.3	18.0
Higher Education-University	11.7	1.0	6.6	9.9	0.5	5.7
Higher Education-No University	0.5	0.5	0.5	0.9	0.5	0.7
Graduate School	0.3		0.2	0.2		0.1
No spouse	22.6	15.5	19.2	24.4	13.9	19.8
	100	100	100	100	100	100

Source: LSMS 98

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ANNEX 3

Table A3.1 LIVING CONDITIONS SURVEY, 1998 BIVARIATE PROBIT (Estimates Parameters) CHILDREN BETWEEN 10 TO 14 YEARS OLD

Variable	Urban Area				Rural Area				Variable	Urban Area				Rural Area			
	Coef.	Robust Std. Err.	z	P>|z|	Coef.	Robust Std. Err.	z	P>|z|		Coef.	Robust Std. Err.	z	P>|z|	Coef.	Robust Std. Err.	z	P>|z|
WORK									NOT SCHOOL								
Girl	-0.120	0.086	-1.41	0.16	-0.282	0.075	-3.78	0.00	Girl	-0.007	0.119	-0.06	0.95	-0.021	0.082	-0.26	0.80
Region									Region								
Sierra	-0.145	0.085	-1.71	0.09	0.303	0.082	3.72	0.00	Sierra	0.163	0.116	1.40	0.16	0.229	0.092	2.48	0.01
Amazonia	-0.009	0.129	-0.07	0.95	0.361	0.131	2.77	0.01	Amazonia	0.084	0.187	0.45	0.65	-0.008	0.140	-0.06	0.96
Demographics									Demographics								
Babies	0.061	0.129	0.47	0.64	0.081	0.087	0.93	0.35	Babies	0.079	0.171	0.46	0.64	0.173	0.100	1.73	0.08
Babies squared	-0.038	0.052	-0.73	0.47	-0.032	0.026	-1.25	0.21	Babies squared	-0.010	0.069	-0.14	0.89	-0.046	0.031	-1.49	0.14
Children	-0.186	0.138	-1.35	0.18	0.078	0.114	0.68	0.50	Children	-0.460	0.176	-2.62	0.01	-0.112	0.125	-0.90	0.37
Children squared	0.044	0.024	1.82	0.07	-0.002	0.018	-0.10	0.92	Children squared	0.091	0.029	3.14	0.00	0.022	0.019	1.15	0.25
Adults	0.091	0.121	0.75	0.46	-0.151	0.087	-1.73	0.08	Adults	0.273	0.165	1.66	0.10	-0.082	0.094	-0.88	0.38
Adults squares	-0.005	0.015	-0.33	0.75	0.020	0.010	2.06	0.04	Adults squares	-0.027	0.020	-1.33	0.18	0.017	0.010	1.66	0.10
Female head	-0.172	0.203	-0.84	0.40	-0.264	0.189	-1.40	0.16	Female head	-0.131	0.209	-0.63	0.53	-0.315	0.206	-1.53	0.13
Age head	-0.028	0.024	-1.16	0.25	0.008	0.021	0.40	0.69	Age head	0.016	0.038	0.42	0.68	0.002	0.024	0.08	0.93
Age squared head	0.000	0.000	0.60	0.55	0.000	0.000	-0.11	0.92	Age squared head	0.000	0.000	-0.74	0.46	0.000	0.000	-0.37	0.71
Education of head									Education of head								
Adults education	0.043	0.483	0.09	0.93	0.275	0.230	1.20	0.23	Adults education	-0.171	0.469	-0.37	0.72	-0.203	0.207	-0.98	0.33
Primary	-0.508	0.262	-1.94	0.05	-0.233	0.126	-1.85	0.06	Primary	-0.805	0.257	-3.14	0.00	-0.051	0.125	-0.41	0.68
Secondary	-0.867	0.273	-3.18	0.00	-0.489	0.184	-2.66	0.01	Secondary	-1.441	0.311	-4.64	0.00	-0.497	0.246	-2.02	0.04
Higher level	-1.019	0.290	-3.51	0.00	-0.386	0.311	-1.24	0.21	Higher Level	-1.433	0.322	-4.45	0.00	-0.811	0.407	-1.99	0.05
Sector formal/informal head									Sector formal/informal head								
Informal	0.165	0.093	1.76	0.08	0.307	0.138	2.22	0.03	Informal	-0.028	0.144	-0.20	0.84	0.265	0.195	1.36	0.17
Agriculture	0.265	0.218	1.22	0.22	0.508	0.131	3.89	0.00	Agriculture	0.135	0.259	0.52	0.60	0.384	0.188	2.04	0.04
Not employee	-0.672	0.196	-3.42	0.00	-0.119	0.198	-0.60	0.55	Not employee	0.108	0.224	0.49	0.63	0.235	0.248	0.95	0.34
Wages head	-0.00000001	0.000	-0.60	0.55	-0.0000002	0.000	0.42	0.67	Wagess head	-0.0000003	0.000	1.51	0.13	-0.0000002	0.000	-1.86	0.06

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Education of spouse								Education of spouse						
Adults education	-0.379	0.692	-0.55	0.58	-0.094	0.259	-0.36	0.72	Adults education	-5.591	0.308	-18.17	0.00	0.468	0.246	1.91	0.06
Primary	0.222	0.227	0.98	0.33	-0.472	0.116	-4.06	0.00	Primary	0.055	0.263	0.21	0.83	-0.161	0.118	-1.36	0.17
Secondary	0.023	0.242	0.09	0.93	-0.594	0.185	-3.21	0.00	Secondary	-0.170	0.293	-0.58	0.56	-0.734	0.245	-2.99	0.00
Higher level	0.127	0.274	0.46	0.64	-0.959	0.376	-2.55	0.01	Higher level	0.036	0.356	0.10	0.92	-1.360	0.406	-3.35	0.00
Not spouse	0.444	0.291	1.52	0.13	-0.232	0.200	-1.16	0.25	Not spouse	0.160	0.322	0.50	0.62	0.392	0.214	1.83	0.07
Constant	0.784	0.744	1.05	0.29	0.102	0.573	0.18	0.86	Constant	-0.939	1.055	-0.89	0.37	-0.798	0.656	-1.22	0.22
Rho	0.526	0.063			0.572	0.044			*Note.* The reference categories are: coast region, none education head, modern economic sector and none education spouse; Domestic labor (household)=work								
Wald test for rho=0			Prob= 0.00				Prob= 0.00										

Table A3.2 LIVING CONDITIONS SURVEY, 1998 BIVARIATE PROBIT (Estimates Parameters) CHILDREN BETWEEN 15 TO 17 YEARS OLD

	Urban Area				Rural Area					Urban Area				Rural Area			
Variable	Coef.	Robust Std. Err.	z	P>|z|	Coef.	Robust Std. Err.	z	P>|z|	Variable	Coef.	Robust Std. Err.	z	P>|z|	Coef.	Robust Std. Err.	z	P>|z|
WORK									NOT SCHOOL								
Girl	-0.196	0.098	-2.01	0.04	-0.566	0.122	-4.64	0.00	Girl	-0.038	0.105	-0.36	0.72	0.044	0.103	0.42	0.67
Region									Region								
Sierra	-0.239	0.103	-2.33	0.02	0.076	0.129	0.59	0.55	Sierra	-0.177	0.110	-1.61	0.11	-0.076	0.111	-0.69	0.49
Amazonia	-0.100	0.175	-0.57	0.57	-0.091	0.204	-0.45	0.66	Amazonia	-0.371	0.195	-1.90	0.06	-0.074	0.174	-0.43	0.67
Demographics									Demographics								
Babies	0.293	0.129	2.27	0.02	0.092	0.144	0.64	0.52	Babies	0.535	0.135	3.96	0.00	0.309	0.124	2.48	0.01
Babies squared	-0.127	0.042	-2.99	0.00	-0.008	0.045	-0.17	0.87	Babies squared	-0.160	0.041	-3.86	0.00	-0.035	0.040	-0.87	0.39
Children	-0.159	0.124	-1.28	0.20	0.166	0.107	1.55	0.12	Children	-0.242	0.112	-2.16	0.03	0.023	0.095	0.24	0.81
Children squared	0.053	0.032	1.67	0.10	-0.024	0.019	-1.24	0.21	Children squared	0.067	0.025	2.67	0.01	0.001	0.018	0.07	0.95
Adults	0.128	0.146	0.88	0.38	0.192	0.152	1.26	0.21	Adults	0.341	0.160	2.13	0.03	-0.111	0.136	-0.82	0.42
Adults squares	0.005	0.015	0.32	0.75	-0.012	0.014	-0.81	0.42	Adults squares	-0.030	0.017	-1.75	0.08	0.011	0.013	0.84	0.40
Female head	0.480	0.208	2.31	0.02	-0.298	0.281	-1.06	0.29	Female head	-0.125	0.222	-0.56	0.57	0.136	0.268	0.51	0.61
Age head	-0.108	0.028	-3.91	0.00	-0.064	0.031	-2.08	0.04	Age head	-0.079	0.026	-3.09	0.00	-0.066	0.024	-2.74	0.01
Age squared head	0.001	0.000	3.12	0.00	0.000	0.000	1.69	0.09	Age squared head	0.001	0.000	2.44	0.02	0.001	0.000	2.25	0.02

Education of head							Education of head					
Adults education	-0.209	0.608	-0.34	0.73	0.255	0.402	0.63	0.53	Adults education	0.063	0.597	0.11	0.92	-0.538	0.364	-1.48	0.14
Primary	-0.369	0.255	-1.45	0.15	-0.190	0.200	-0.95	0.34	Primary	-0.340	0.280	-1.21	0.23	-0.111	0.170	-0.65	0.51
Secondary	-0.748	0.266	-2.82	0.01	-0.689	0.293	-2.35	0.02	Secondary	-0.559	0.291	-1.92	0.06	-0.847	0.269	-3.15	0.00
Higher level	-1.010	0.293	-3.45	0.00	-0.608	0.474	-1.28	0.20	Higher Level	-0.462	0.324	-1.43	0.15	-1.266	0.463	-2.73	0.01
Sector formal/informal head									Sector formal/informal head								
Informal	0.302	0.112	2.71	0.01	0.125	0.201	0.62	0.53	Informal	0.087	0.121	0.72	0.47	0.124	0.184	0.68	0.50
Agriculture	0.498	0.302	1.65	0.10	0.564	0.198	2.84	0.00	Agriculture	-0.189	0.291	-0.65	0.52	0.453	0.177	2.57	0.01
Not employee	-0.145	0.168	-0.86	0.39	-0.480	0.292	-1.65	0.10	Not employee	0.051	0.206	0.25	0.80	-0.059	0.267	-0.22	0.83
Wages head	-0.00000002	0.000	-1.05	0.29	-0.00000009	0.000	-1.29	0.20	Wages head	-0.00000005	0.000	-1.43	0.15	-0.0000002	0.000	-2.35	0.02
Education of spouse									Education of spouse								
Adults education	-0.282	0.819	-0.34	0.73	6.022	0.301	19.99	0.00	Adults education	0.302	0.504	0.60	0.55	-1.131	0.407	-2.78	0.01
Primary	-0.621	0.316	-1.96	0.05	-0.399	0.190	-2.10	0.04	Primary	-0.086	0.317	-0.27	0.79	-0.557	0.163	-3.42	0.00
Secondary	-0.821	0.333	-2.46	0.01	-0.336	0.298	-1.13	0.26	Secondary	-0.652	0.330	-1.98	0.05	-0.600	0.274	-2.19	0.03
Higher level	-0.542	0.366	-1.48	0.14	-0.264	0.479	-0.55	0.58	Higher level	-0.672	0.382	-1.76	0.08	-1.271	0.580	-2.19	0.03
Not spouse	-0.871	0.367	-2.38	0.02	0.103	0.310	0.33	0.74	Not spouse	-0.071	0.377	-0.19	0.85	-0.558	0.279	-2.00	0.05
Constant	3.719	0.837	4.44	0.00	2.467	0.934	2.64	0.01	Constant	1.549	0.770	2.01	0.04	2.670	0.700	3.81	0.00
Rho	0.441	0.058			0.484	0.064			*Note.* The reference categories are: coast region, none education head, modern economic sector and none education spouse; Domestic labor (household)=work								
Wald test for rho=0			Prob= 0.00				Prob= 0.00					

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